MATVEYEV K. I.

USSR / Microbiology. Microbes Pathogenic for Man and Animals. Bacteria. Anaerobic Bacilli. F

Abs Jour : Re Zhur - Biologiya, No 6, 1959, No. 24111

Author : Koroleva, G. A.; Matveyev, K. I.; Volkova, Z. M.
Inst : Not given
Title : Obtaining Bi- and Polyvalent Antibotulin Sera of Types A, B, C, E from Horses. Report II

Orig Pub : Zh. mikrobiol., epidemiol. i immunobiol., 1958, No 5, 83-87

Abstract : No abstract given

Card 1/1

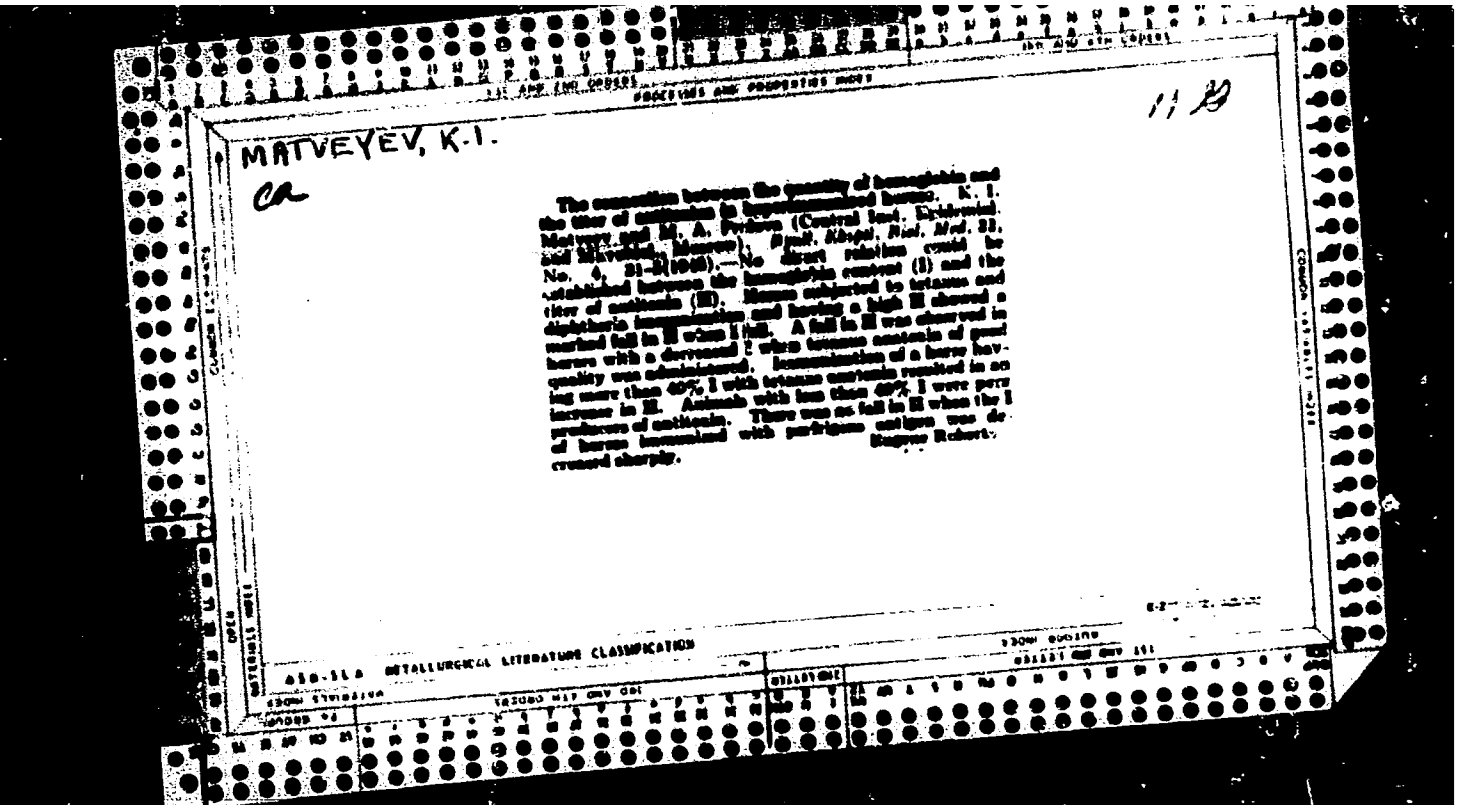
MATVEYEV, Prof. Konstantin I.

Mbr., Inst. Epidemiology, Microbiology, & Infectious Diseases im. N. F. Gamaleya, Dept. Hygiene, Microbiology, & Epidemiology, Acad. Med. Sci., -1947-c49-.
Mbr., Chair Microbiology, 2nd Moscow Med. Inst. im. Stalin, -1947-.
"The Changes of the Reactivity of the Central Nervous System in Active and Passive Immunization Against Tetanus," Byul. Eks. Biol. i Med., 23, No. 6, 1947;
"Reaction of Botulinus Toxin on the Vascular Tissues of Humans and Animals," Byul. Eks. Biol. i Med., 24, No. 3, 1947;
"The Action of Penicillin and Streptomycin Upon Association of Bacteria in Anaerobic Infections," Khirurfiya, No. 1, 1949;
"Effects of Penicillin and Streptomycin on Symbiotic Bacteria Causing Wound Infections," Khirurfiya, No. 9, 1949;
"Pathogenesis of Botulism," Sov. Med., No. 11, 1949; "To the Microbiologists of America," Literaturnaya Gazeta, 61, 1950.

(C917850).

MATVEYEV, K. I.

"Passive Transmission of Allergy and Cellular Immunity," ZhMEI, 6, 1940


MATVEYEV, K.I.

CA

11 B

The connection between the quantity of hemoglobin and the titer of antibodies in hyperimmunized horses. K. I. Matveyev and M. A. Pavlova (Central Inst. Epidemiol. and Microbiol., Moscow). Zhur. Mikrobiol. Epidemiol. Immunobiol. No. 4, 31-3(1955).—No direct relation could be established between the hemoglobin content (I) and the titer of antibodies (II). Horses subjected to intense and diphtheria immunization and having a high II showed a marked fall in I when I fell. A fall in II was observed in horses with a decreased I when intensive antigenic stimulation was administered. Immunization of a horse having quality was administered. Immunization of a horse having more than 60% I with intense antigenic stimulation resulted in an increase in II. Animals with less than 60% I were poor producers of antibodies. There was no fall in II when the I of horses immunized with pertussis antigen was decreased sharply.

Eugene Robert-

A50-11A METALLURGICAL LITERATURE CLASSIFICATION

MATVEYEV, K. I.

PA 14T13

USSR/Medicine - Immunity May 1947
Medicine - Tetanus, immunity

"The Changes of the Reactivity of the Central Nervous System in Active and Passive Immunization Against Tetanus," K. I. Matveyev, S. K. Sokolov, 4 pp

"Eksp Biol i Med" Vol XXIII, No 6

Detailed discussion of results of experiments with rabbits, explaining the therapeutic effect of injecting large doses of serum into the blood or a muscle.

14T13

MATVEYEV, K. I.

"Pathogenesis of Botulism - IV: Reaction of Vascular Tissues of Humans and Animals to Botulismtoxin"

Inst. of Microbiology, Epidemiology & Infectious Diseases, Academy of Medical Sciences USSR Moscow and Chair of Microbiology, Second/Medical Institute imeni I. V. Stalin

Byulleten Eksperimental'noy Biologii i Meditsiny, Vol. 24, No. 4, 1947

-W-513, 24 May 1948
PA 23177

MATVEYEV, K. I.

"Pathogenesis of Botulism; Communication VII: Antitoxic Immunity of Cells of Animal Organs," ZhMEI, 7, 75-78, 1948

17(2,12) SOV/16-59-9-16/47

AUTHOR: Matveyev, K.I.

TITLE: The Effects of Manifold Administration of Sublethal Doses of Clostridium Botulinum Toxin

PERIODICAL: Zhurnal mikrobiologii, epidemiologii i immunobiologii, 1959, 30, Nr 9, pp 71-78 (USSR)

ABSTRACT: In 1936 S.M. Minervin and Ye.N. Kotlyarovskaya used sublethal doses of toxin to produce experimental botulism in spore-infected animals and thereby demonstrated the important part that Behring's phenomenon plays in the pathogenesis of botulism. The pathogenetic causes of Behring's phenomenon were studied in tests with diphtheria toxin by A.T. Kravchenko, N.V. Galanova, K.I. Matveyev, T.I. Bulatova, A.P. Gindin and Kolesnikova, and in tests with tetanus toxin by I.N. Morgunov and V.V. Khatuntsev. P.F. Zdrodovskiy explains the phenomenon away as a summation of stimuli. In view of the confusion over this issue, the author tried out the effects of repeated administration of small doses of Cl. botulinum toxin on guinea pigs, rabbits and mice. Repeated administration of small doses of the toxin induced botulism with subsequent death in all these animals, although the total dose of toxin was much less than the lethal dose for a single application. When the sum dose of

Card 1/3

The Effects of Manifold Administration of Sublethal Doses of Clostridium Botulinum Toxin

toxin, administered piecemeal, was introduced at one injection the animals remained healthy. Guinea pigs were most sensitive to repeated administration of toxin A; the rabbits and mice less so. As small doses of toxin were administered, the animal's vessels at first showed an enhanced sensitivity, with immunity developing at a later date. The author concludes that his findings are of importance in their application to human food poisoning by Cl. botulinum, since here repeated ingestion of sublethal doses of Cl. botulinum toxin is sufficient to cause death.

There are 2 tables and 12 references, 10 of which are Soviet, 1 German and 1 English.

SOV/16-59-9--16/47

The Effects of Manifold Administration of Sublethal Doses of Clostridium Botulinum Toxin

ASSOCIATION: Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR (Institute of Epidemiology and Microbiology imeni Gamaleya of the AMN, USSR)

SUBMITTED: March 5, 1958

Card 3/3

USSR / Microbiology. Microorganisms Pathogenic to Humans and Animals. F-5

Abs Jour : Ref Zhur - Biol., No 20, 1958, No. 90970

Author : Koroleva, G. A.; Matveyev, K. I.; Volkova, Z. M.

Inst : Not given

Title : The Derivation from Horses of Therapeutic Antibotulinus Sera Type C and E. Communication I.

Orig Pub : Zh. mikrobiol., epidemiol., i immunobiol., 1958, No 3, 102-106

Abstract : No abstract given

Card 1/1

SOLOV'YEV, S.V.; MATVEYEV, K.I.

Epidemiology and prevention of tetanus in Krasnodar Territory. Zhur. mikrobiol. epid. i immun. 29 no.12:87-93 D '58. (MIRA 12:1)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.
(TETANUS,
epidemiol. & prev. (Rus))

BYCHENKO, B.D.; MATVEYEV, K.I.; BULATOVA, T.I.; DAVYDOVA, N.V.

Serological groups of Clostridium perfringens studied by precipitation reaction. Zhur.mikrobiol.epid. i immun. 30 no.1:81-85 Ja '58. (MIRA 12:3)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(CLOSTRIDIUM PERFRINGENS,
serol. type, precipitation reaction (Rus))

MATVEYEV, K.I., BULATOVA, T.I.

Effect on the organism of sublethal doses of tetanus toxin administered repeatedly [with summary in English]. Biul. eksp.biol. i med. 46 no.9:49-52 S'58 (MIRA 11:11)

1. Iz Instituta epidemiologii i mikrobiologii imeni N.F. Gamalei (ispolnyayushchiy obyazannosti dir. - prof. S.N. Muromtsev) AMN SSSR, Moskva. Predstavlena deystvitel'nym chlenom AMN SSSR L.Z. Zil'berom.
(TETANUS,
toxin, eff. of sublethal repeated admin. on animals (Rus))

MATVEYEV, K.I.; SERGIYEVA, T.I.

Peacetime epidemiology of tetanus in the U.S.S.R. and in foreign countries. Zhur.mikrobiol.epid. i immun. 30 no.2:134-142 F '59. (MIRA 12:3)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.
(TETANUS, epidemiol.
world distribution in peace-time (Rus))

MATVEYEV, K.I.

"Principles of experimental medical bacteriology" by V.D. Timakov, D.M. Gol'dfarb. Reviewed by K.I. Matveev. Zhur.mikrobiol.epid. i immun. 30 no.2:155-156 F '59. (MIRA 12:3)

(BACTERIOLOGY, MEDICAL)
(TIMAKOV, V.D.)
(GOL'DFARB, D.M.)

SOLOV'YEV, S.V.; MATVEYEV, K.I.

Serotherapy of experimental gas infection induced by Clostridium oedematiens or septicum associated with aerobic organisms; author's abstract. Zhur.mikrobiol.epid. i immun. 30 no.5:126 My '59. (MIRA 12:9)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(GAS GANGRENE, exper.
eff. of serother. on gangrene induced by Clostridium oedematiens or septicum assoc. with aerobic organisms (Rus))
(SEROTHERAPY,
in exper. gas gangrene induced by Clostridium oedematiens or septicum assoc. with aerobic organisms (Rus))

BYCHENKO, B.D.; MATVEYEV, K.I.

Some properties of Cl. perfringens types A, B, C, D, F in relation to the type specificity of their strains. Zhur.mikrobiol.,epid.i immun. 30 no.12:62-67 D '59. (MIRA 13:5)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(CLOSTRIDIUM PERFRINGENS)

MATVEYEV, Konstantin Ivanovich; SOKOLOV, N.I., red.; SENCHILO, K.S., tekhn. red.

[Epidemiology and prevention of tetanus] Epidemiologiia i profilaktika stolbniaka. Moskva, Gos. izd-vo med. lit-ry Medgiz, 1960. 337 p. (MIRA 14:7)
(TETANUS)

MATVEYEV, K.I.; BULATOVA, T.I.; SERGEYEVA, T.I.

Immunizing minks against botulism [with summary in English].
Veterinariia 35 no.8:42-46 Ag '58. (MIRA 11:9)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamaleya AMN SSSR.
(Minks--Diseases and pests) (Botulism)

MATVEYEV, KONSTANTIN IVANOVICH

Botulism (Botulism) Moskva, Medgiz., 1959.
406 P. Illus., Tables.
Bibliography: P. 372-401

SOLOV'YEV, S.V.; MATVEYEV, K.I.

Effect of synthomycin and levomycin alone or in combination with antigangrene serum in experimental gas infection produced by an association of microorganisms. Eksper. khir. 5 no. 2:62 Mr-Ap '60. (MIRA 14:1)

(GANGRENE) (CHLOROMYCETIN) (SERUM)

MATVEYEV, K.I.; IVAROV, O.V.; ZHAVORONKOV, N.M.

Separation coefficients of chlorine isotopes in the vaporization of Cl_2 at equilibrium. Zhur.fiz.khim. 34 no.9:2123 S '60. (MIRA 13:9)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova.
(Chlorine--Isotopes)

SOLOV'YEV, S.V.; MATVEYEV, K.I.

Effect of levomycetin on experimental gas infection caused by associations of microorganisms. Antibiotiki 6 no.11:1026-1030 N '61. (MIRA 15:3)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamalei AMN SSSR.
(LEVOMYCETIN) (GAS GANGRENE)

MATVEYEV, K.I.; BULATOVA, T.I.; SERGEYEVA, T.I.

Mass immunization of minks against botulism in wild animal state breeding farms in the U.S.S.R. Zhur.mikrobiol., epid. i immun. 32 no.11:138-139 N '61. (MIRA 14:11)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.
(BOTULISM—PREVENTIVE INNOCULATION) (MINKS)

MATVEYEV, K.I.; UVAROV, O.V.; ZHAVORONKOV, N.M.

Separation of chlorine isotopes by the chemical exchange method. (MIRA 15:1)
Zhur.prikl.khim. 34 no.11:2563-2566 N '61.
(Chlorine--Isotopes)

MATVEYEV, K.I., prof., kand. med. nauk, red.; SOKOLOV, M.I., prof., red.; KALINA, G.P., red.

[Manual on the microbiological diagnosis of infectious diseases] Rukovodstvo po mikrobiologicheskoi diagnostike infektsionnykh boleznei. Moskva, Meditsina, 1964. 682 p. (MIRA 17:6)

MATVEYEV, K.I., SERGEYEVA, T.I.

Tetanus and its prevention. Sov. med. 28 no.6:[illegible] Je '65.
(MIRA 18:8)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamaleya AMN SSSR, Moskva.

ORZUYEV, M.I.; MATVEYEV, K.I.

Distribution of tetanus pathogen in the soil of Tajikistan, Uzbekistan and Moldavia. Zhur. mikrobiol., epid. i immun. 41 no.11:94-99 '65. (MIRA 18:5)

1. Institut epidemiologii i mikrobiologii Gamalei AMN SSSR.

L 25770-66 EWT(1)/T JK

ACC NR: AP6016974 SOURCE CODE: UR/0016/65/000/006/0011/0016

AUTHOR: Sergeyeva, T. I.—Sergeeva, T. I.; Matveyev, K. I.—Matveev, K. I.; Vasilevskiy, V. I.—Vasilevsk, V. I.

ORG: Institute of Epidemiology and Microbiology im. N. F. Gamaleya, AMN SSSR (Institut epidemiologii i mikrobiologii AMN SSSR)

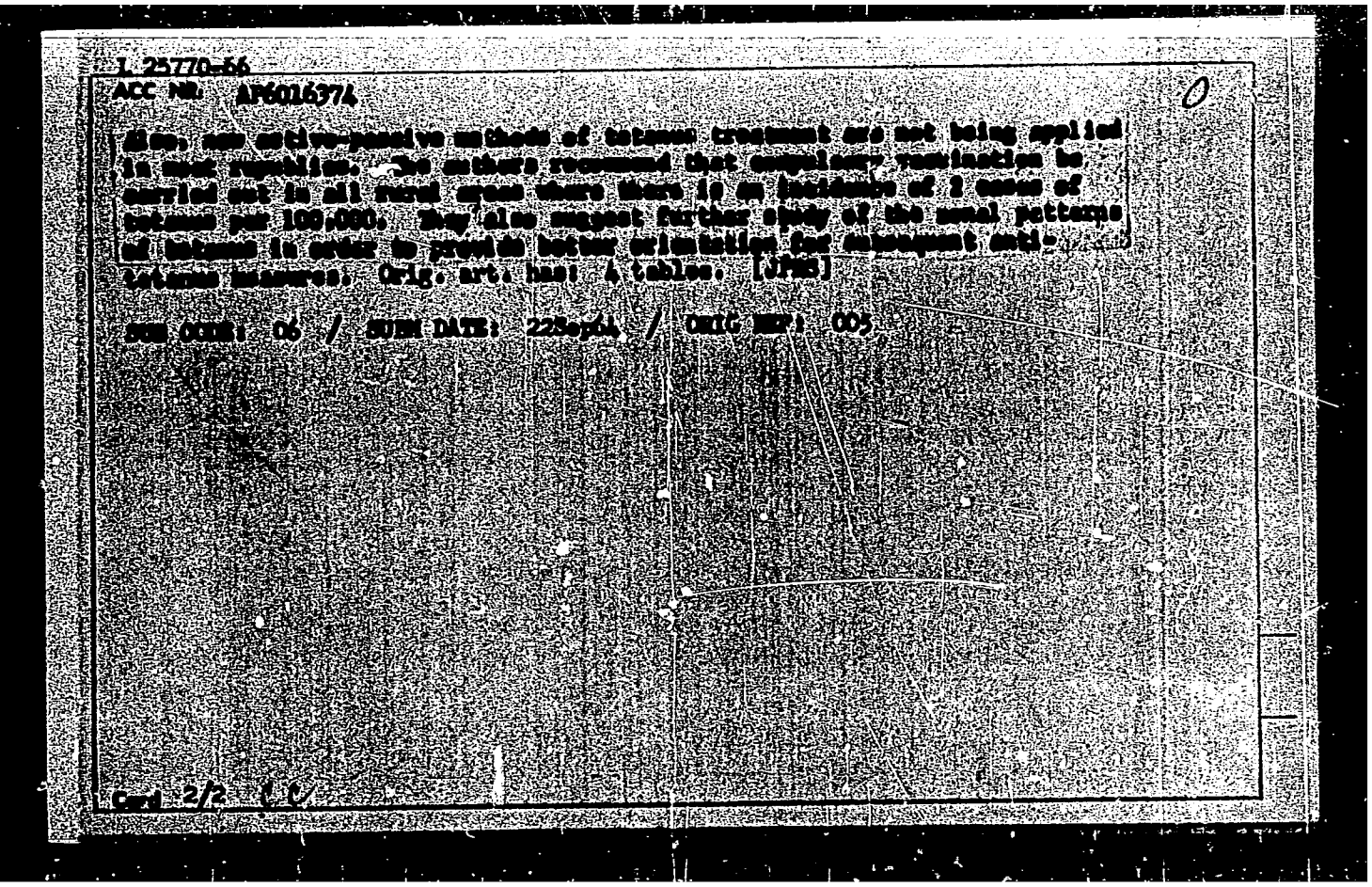
TITLE: Current tetanus prevention in the USSR and its effectiveness

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 6, 1965, 11-16

TOPIC TAGS: immunization, human ailment, bacterial disease

ABSTRACT: The basic measures planned for the 1961-1965 period to reduce and eradicate tetanus in the USSR were: 1) study of the zonal patterns of tetanus infection; 2) immunization of the entire rural population in zones of high infection, i.e., with an index of 3 per 100,000 or higher; 3) compulsory active immunization of all children; and 4) widespread introduction of active-passive tetanus prevention. Analyses of the results of measures taken in the 1959-1963 period show that the incidence of the disease is declining after only 3 years of the 5-year plan for tetanus control. But in spite of the higher incidence of the disease in the rural population, in only a few republics is vaccination more intense in rural areas than in towns. Another reason why the results are not better is that in most republics only one-half or one-third of vaccinated persons are re-vaccinated.

Card 1/2 UDC: 616.981.551-084 (47)



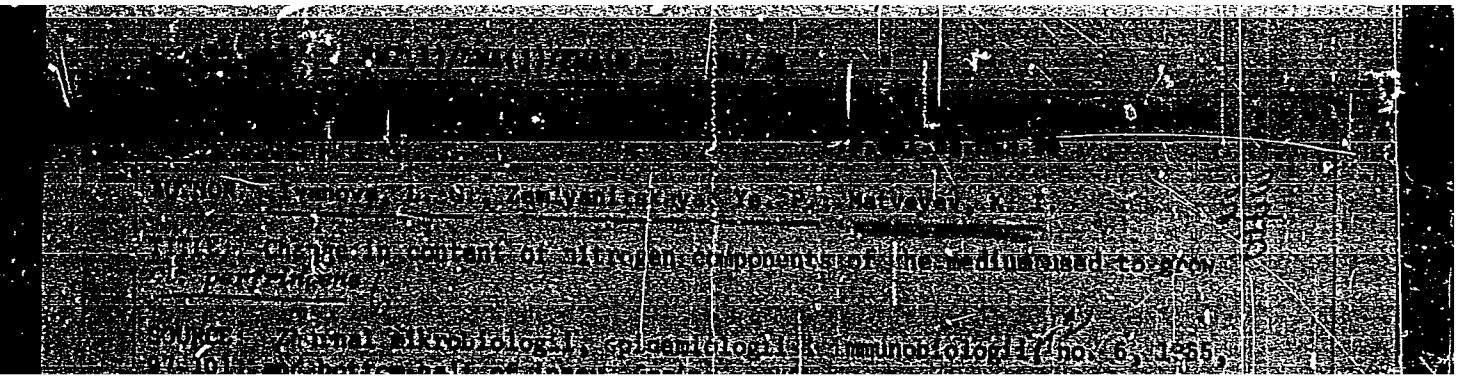
L 25770-66
ACC NR: AP6016374

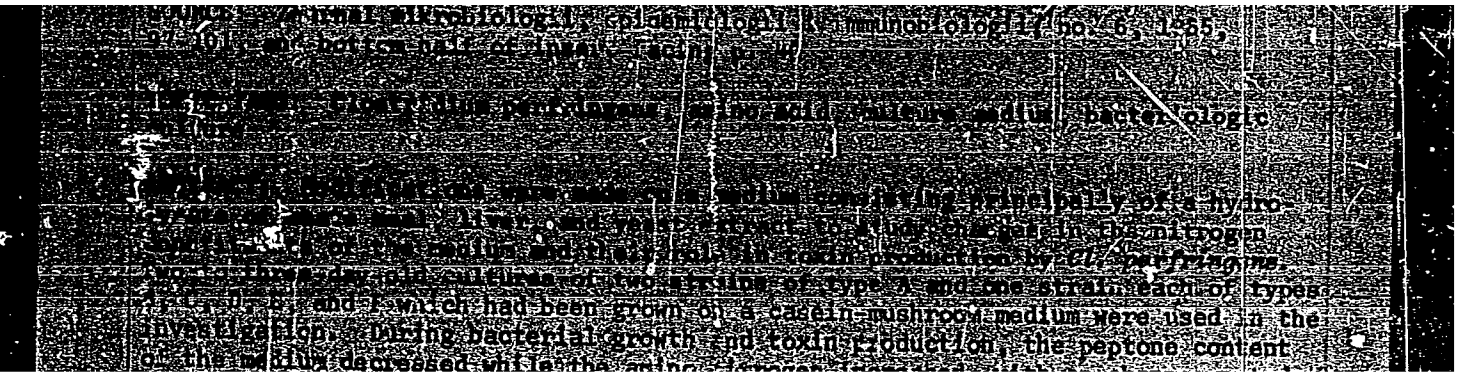
0

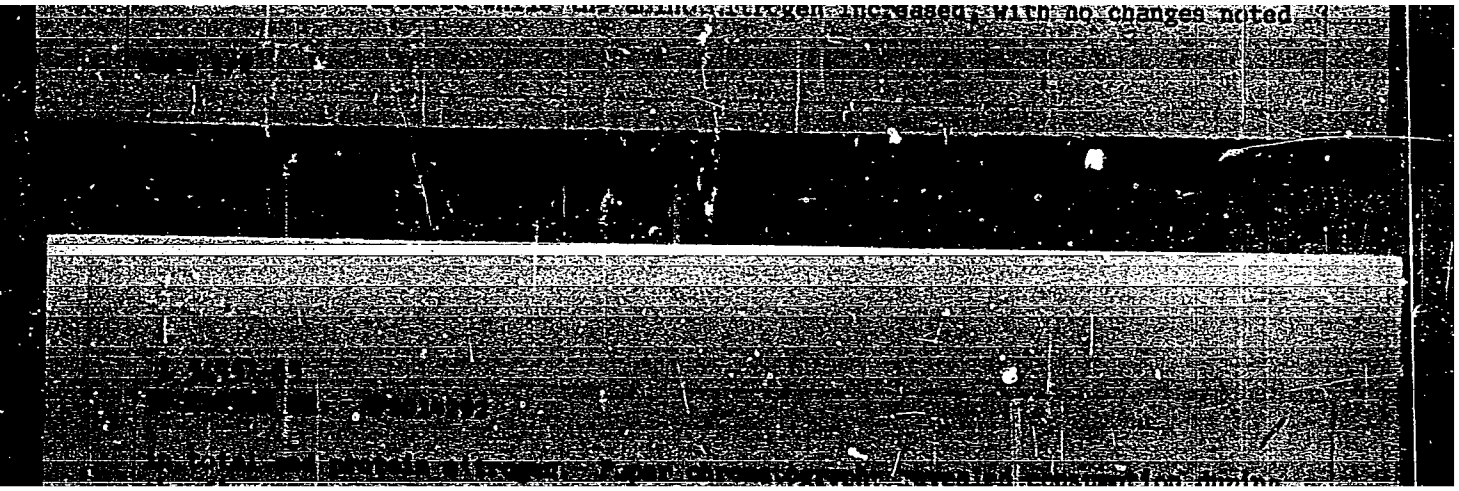
[illegible] new and improved methods of hormone treatment are not being applied in most hospitals. The authors recommend that compulsory vaccination be carried out in all rural areas where there is an incidence of 2 cases of tetanus per 100,000. They also suggest further study of the usual patterns of tetanus in order to provide better epidemiological and subsequent anti-tetanus measures. Orig. art. has: 4 tables. [JPRS]

SUB CODE: 06 / SUBM DATE: 22Sep65 / ORIG REF: 005

Card 2/2 LC







BULATOVA, T.I.; MATVEYEV, K.I.

Antigenic structure of the toxins of Clostridium botulinum type C isolated in the U. S. S. R. Zhur. mikrobiol., epid. i immun. 42 no.8:79-84 Ag '65. (MIRA 18:9)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

ACC NR: AP6024443 SOURCE CODE: UR/0016/66/000/007/0086/0090

AUTHOR: Zemlyanitskaya, Ye. P.; Matveyev, K. I.; Tsuri[illegible] E. F.

ORG: Institute of Epidemiology and Microbiology im. Gamaleya, AMN SSSR, Moscow (Institut epidemiologii i mikrobiologii AMN SSSR)

TITLE: Toxin formation in type E Clostridium perfringens

SOURCE: Zhurnal mikrobiologii, epidemiologii, i immunobiologii, no. 7, 1966, 86-90

TOPIC TAGS: toxin, bacterial toxin, Clostridium perfringens, type E Clostridium perfringens, toxin formation, immunology, bacteriology, culture method, culture medium, virulence

ABSTRACT:
Optimal conditions for toxin formation by type E *Clostridium perfringens* were studied in 11 strains from the British National Collection (BNC) and in 1 strain from the State Control Institute imeni Tarasevich (GKI). Organisms grown on casein media produced the most virulent toxins. Crude toxins obtained by culturing strains 4529 (BNC) and 342 (GKI) on a 0.1% vitamin-B-enriched casein pancreatic hydrolysate with millet and cotton at 37°C for 18 to 20 hr

Card 1/2 UDC: 576.851.555.097.29

ACC NR: AP6024443

had an activity of 100 to 200 Dlm/ml. These toxins lost their virulence in periods of 18 hr to 3 months. [WA-50. CBE No. 11]

SUB CODE: 06/ SUBM DATE: 27May65/ ORIG REF: 003/ OTH REF: 002/

Card 2/2

ACC NR: AP6032245 SOURCE CODE: UR/0016/66/000/009/0066/0070

AUTHOR: Bulatova, T. I.; Matveyev, K. I.; Sa-sonova, V. S.

ORG: Institute of Epidemiology and Microbiology, AMN SSSR, Moscow (Institut epidemiologii i mikrobiologii AMN SSSR)

TITLE: Cl. botulinum Type C toxin formation in symbiotic culture

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 9, 1966, 66-70

TOPIC TAGS: bacteria toxin, ~~Cl. botulinum type C~~ botulinus toxin, toxin formation, toxin, bacteria, BOTULISM

ABSTRACT: A study of toxin formation by *Cl. botulinum* type C was performed as part of an evaluation of this strain for use in preparing toxoids and antisera. The original stain was weakly toxic but after growth with another species of *Clostridia* its toxogenicity increased. Similar results occurred when the bacteria were grown with cells of another genus. Physical properties of mixed and control cultures were different; better toxin-forming conditions existing in the former cultures. [WA-50; CBE No. 12]

SUB CODE: 06/ SUBM DATE: 30Jun65/ ORIG REF: 004/ OTH REF: 007/

Card 1/1 UDC: 576.851.553.095.38.097.29

ACC NR: AP6032245 SOURCE CODE: UR/0016/66/000/009/0066/0070

AUTHOR: Bulatova, T. I.; Matveyev, K. I.; Samsonova, V. S.

ORG: itute of Epidemiology and Microbiology, AMN SSSR, Moscow (Institut epidem gii i mikrobiologii AMN SSSR)

TITLE: Cl. botulinum Type C toxin formation in symbiotic culture

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 9, 1966, 66-70

TOPIC TAGS: bacteria toxin, ~~Cl. botulinum type C~~ botulinus toxin, toxin formacion, toxin, bacteria, BOTULISM

ABSTRACT: A study of toxin formation by *Cl. botulinum* type C was performed as part of an evaluation of this strain for use in preparing toxoids and antisera. The original stain was weakly toxic but after growth with another species of *Clostridia* its toxogenicity increased. Similar results occurred when the bacteria were grown with cells of another genus. Physical properties of mixed and control cultures were different; better toxin-forming conditions existing in the former cultures. [WA-50; CBE No. 12]

SUB CODE: 06/ SUBM DATE: 30Jun65/ ORIG REF: 004/ OTH REF: 007/

Card 1/1 UDC: 576.851.553.095.38.097.29

MATVEYEV, K.K.

Electric contact transmitter used for investigating slotted cams. Priborostroenie no.8:26 Ag '60. (MIRA 13:9)
(Electric controllers) (Cams)

MATVEIEV, K.K.

Turning cam mechanisms. Stan.i instr. 31 no.12:21-22 D '60.
(MIRA 13:11)
(Cams)

KLEVTSOV, V.A., kand.tekhn.nauk; MATVEYEV, K.M., inzh.; SUKHAREV, Yu.N., inzh.; GELLERTOV, G.N., inzh.; MART'YANOV, B.Ya., inzh.

Secondary trusses with strand reinforcement in the lower chord. Prom.stroi. 42 no.2:24-28 '65. (MIRA 18:4)

MATVEYEV, K. V.

MATVEYEV, K. V.: "Stream deformations in the regulating installations of bridge structures." Moscow, 1955. Min Railways USSR. Moscow Order of Lenin and Order of Labor Red Banner Inst of Railroad Transport Engineers imeni I. V. Stalin (Dissertation for the Degree of Candidate of Technical Sciences)

SO: Knizhnaya Letopis' No. 47, 19 November 1955. Moscow.

MATVEYEV, K.K., inzh.

Precision of cam-rotating mechanisms. Vest.mashinostr. 43 (MIRA 16:9)
no.8:13-16 Ag '63. (Cams)

MATVEYEV, K. V.

124-11-12705

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr 11, p. 54 (USSR)

AUTHOR: Matveyev, K. V.

TITLE: Local Erosion at the Head of a Wing Dam.
(Mestnyy razmyv u golovy traversa).

PERIODICAL: Tr. Mosk. in-ta zh. -d. transp., 1957, Nr 88/9, pp 139-14

ABSTRACT: It is proposed that the deepening of a river bottom consisting of fine-grain sand near the head of a wing dam be determined from the empirical formula

$$h_p = 27 K_1 K_2 \frac{v_M^2}{g} \tan\frac{\alpha}{2}$$

$$\log K_1 = -2.215 \sqrt{\frac{v_M^2}{g b}} \qquad \log K_2 = -0.087\, m$$

where b is the projection of the mean length of the wing dam upon the normal to the axis of the stream flow, m is the slope coefficient of the wing dam, $\alpha^0 < 90^0$ is the impingement angle of the stream flow

Card 1/2

Local erosion at the head of a wing dam (continued)

on the wing dam (when $\alpha > 90^\circ$, $\tan \alpha/2$ is assumed to be = 1); the local impingement velocity of the stream velocity on the wing dam entering into the formula is determined from the expression

$$v^2 = v_0^2 \left(1 + 3.2 \frac{Q_n}{Q} \right)$$

where Q_n is the flow rate which had passed through the now dammed-up portion of the active channel-bed section prior to the construction of the dam, Q is the overall flow rate, v_0 is the mean flow velocity. Recommendations are formulated on the basis of tests made in rectilinear trough having a rectangular cross-section 150 cm wide and 700 cm long, observing the erosion of sand having a grain size of 0.33 near wing dams (without aprons or any other accessory structures) covering from 10 to 40 percent of the width of the trough. The depths were measured upon completion of each test run, the settling of the suspended matter, and the draining of the water; no measurements were made during test runs. A comparison of the calculations made with the aboveindicated formula against the published recommendations of other investigators and against full-scale measurements is not provided.

M. S. Vyzgo

Card 2/2

MATVEYEV, K.V., ispolnyayushchiy obyazannosti dotsenta, kand.tekhn.nauk;
MIKHAYLOVA, N.A., kand.fiz.-matem.nauk

Investigating local channel deformations in the after bay.
Trudy MIIT no.107:70-80 '60. (MIRA 13:7)
(Hydraulics)

MATVEYEV, K.V., inzhenyer-gidrolog obyazannosti dotsenta, kand.tekhn.nauk;
SHAO ZIN'-IYUN [Shao Hsin-yung], aspirant

Investigating the erosion of cohesive grounds. Trudy MIIT no.107:81-94 1960 (MIRA 13:7)
(Erosion) (Hydraulics)

MATVEYEV, K.V., kand. tekhn. nauk, dotsent

Dynamic action of single gravity waves on horizontal plates.
Trudy MIIT no.164:179-188 '63.
(MIRA 18:3)

MATVEYEV, K.V., kand. tekhn. nauk; MUROMOV, V.S., kand. tekhn. nauk; VOLCHENKOV, G.Ya., inzh.

Power damping and erosion in tailrace culverts. Trudy MIIT no.176:34-52 '63. (MIRA 17:6)

MATVEYEV, L. A.

USSR/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 174

Author : I.S. Mustafin, L.A. Matveyev, Ye.A. Kashkovskaya.

Inst : Academy of Sciences of USSR.

Title : On the Question of the Influence of Hydrogen Links on the Color of Organic Compounds.

Orig Pub : Dokl. AN SSSR, 1957, 113, No 3, 610-613

Abstract : The solutions of the halogenanil acids are colored violet. The color is retained, if alkali was added, but the intensity of the coloration drops sharply. This effect is explained by the presence of intramolecular hydrogen links, because the previously published experimental data, as well as those established by the authors indicate that these links break at the dissociation of the acids. The above mentioned spectral effect is not revealed at the

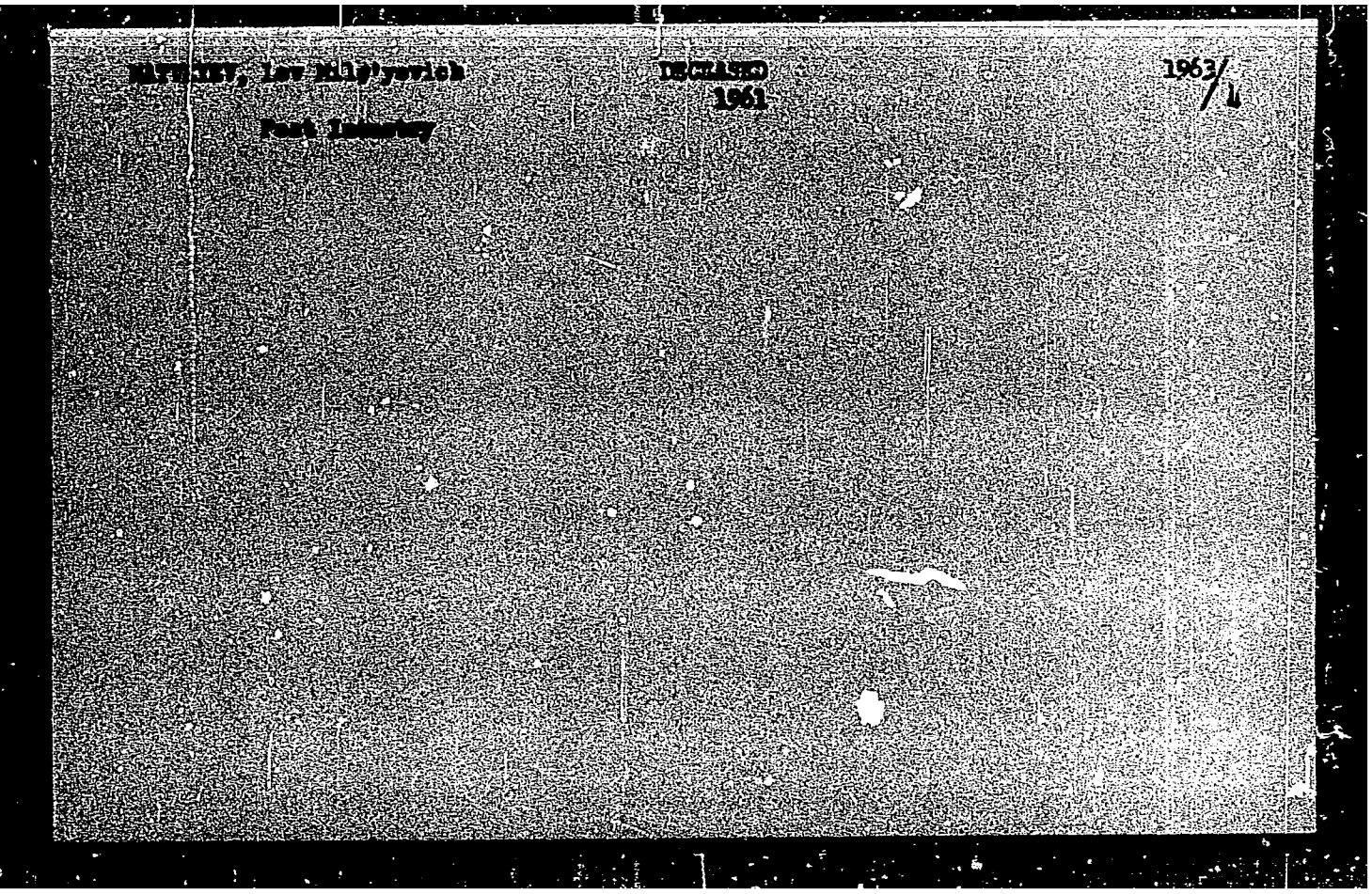
Card 1/2

USSR/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 174

action of alkali on n,n'-dioxy-2,5-diphenylbenzoquinone-1, 4, because hydrogen links are absent in this molecule. The developed point of view is confirmed also by the fact that if the halogenanil acids were diluted, the molar extinction factors and the light absorption decrease at a greater rate than it could be expected based on the concentration decrease.

Card 2/2



MATVEYEV, L.N., starshiy inzhener

Section of communist labor. Avtom. telem. i sviaz' 4 no.9:18-20 S '60. (MIRA 13:9)

1. Otdel signalizatsii, tsentralizatsii i blokirovki slushby signalizatsii i svyazi Tomskoy dorogi.
(Railroads—Signaling)

MATVEYEV, L.O.

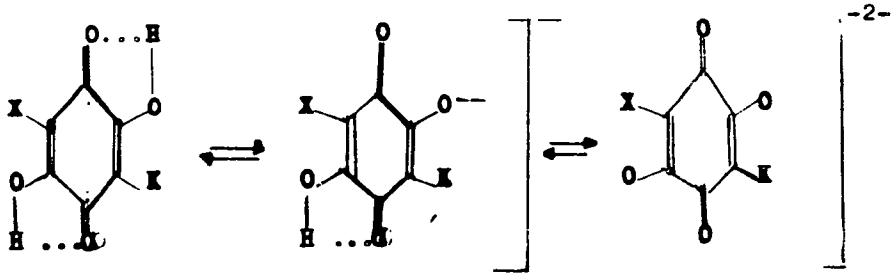
AUTHOR MUSTAFIN I.S., MATVEYEV L.O., KASHOVSKAYA Ye.A. PA - 3158

TITLE On the question of how the colour of organic compounds is affected by their internal hydrogen bonds.
(K voprosu o vliyanii vnutrennykh vodorodnykh svyazey na okrasku organicheskikh soyedineniy.- Russian)

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 3, pp 610-613 (U.S.S.R.)

Received: 6/1957 Reviewed: 8/1957

ABSTRACT On the basis of the comparison and analysis of all available data the authors came to the conclusion that the dissociation of halide aniline acids is to be represented by the following scheme:



colored colorless

CARD 1/3

On the question of how the colour of organic compounds is affected by their internal hydrogen bonds. PA - 3158

The conception concerning innermolecular hydrogen compounds gives an idea how to understand the optimum properties of the solutions of halide anile acids. On the basis of the above scheme the following may be said:

1) When solutions of halide anile acids are diluted their optical density must diminish more rapidly than follows from the computation carried out on the basis of the concentration of the dissolved substances.

2) An addition of strong mineral acids leads to an increase of the intensity of the coloring of solutions; whereas an addition of bases leads to a considerable decrease.

3) The soluble salts of these acids must give the solutions the same color as the acid.

4) The molar coefficients for the extinction of the acids must be greater in the absorption maximum than those of the soluble salts.

5) If substances are added to the acids which mix easily with water and have small dielectric constants, this must lead to an increase of the coloring intensity of the solutions.

All these conclusions agree fully with experimental results.

CARD 2/3

PA - 3158

On the question of how the colour of organic compounds is affected by their internal hydrogen bonds.

The follows a description of these experiments.
(With 1 Illustration and 6 citations from Slavic publications.)

ASSOCIATION: State University "N.G. CHERNYSHEVSKIY" of Saratov.
(Saratovskiy gosudarstvennyy universitet im. N.G. Chernishevskogo.)
PRESENTED BY: I.N. Nazarov, Member of Academy, 20.11. 1957
SUBMITTED: 27.9. 1956.
AVAILABLE: Library of Congress.

CARD 3/3

AUTHORS: Mustafin, I. S., Matveyev, L. O. 32-3-1/52

TITLE: Phenolcarboxylic Acids of the Triphenylmethane Series Applied for Analysis (Analiticheskoye primeneniye fenolkarbonovykh kislot trifenilmetanovogo ryada). The Determination of Beryllium in Rocks, Minerals, and Alloys (Opredeleniye berilliya v gornykh porodakh, mineralakh i splavakh)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 3, pp. 259-262 (USSR)

ABSTRACT: Among the phenolcarboxylic acids, "dichlorsulphodimethyloxyfuksondicarboxylic acid" was found to be a suitable reagent for beryllium. It is known as a coloring agent under the name "khromoksan pure blue 6R" and is called "Al'beron" in this paper. Its sodium salt was already found to be an indicator for various ions and was also recommended as a coloring reagent for beryllium. Al'beron can be used for the purpose of determining quantities of 0.025 γ/ml Be^{2+}, in which case its yellow color turns blue-violet. Measurements were carried out on a Pulfrich-photometer at λ = 570 mμ, with a pH of 4.4 - 4.6 being mentioned as an optimum, because trilon B, which is necessary for the

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Phenolcarboxylic Acids of the Triphenylmethane Series Applied for Analysis. The Determination of Beryllium in Rocks, Minerals, and Alloys

32-3--1/52

elimination of other ions, destroys the color in the case of pH> 4.8. An analyzation process for bronze is mentioned, with which the buffer solution according to A. K. Babko [Ref. 9] was produced. It was found that a melt of minerals containing beryllium with granite-like silicates and soda or soda-potash mixtures lead to simple dissolution. The accompanying ions are blockes with trilon B. Two varieties of this analysis are mentioned, and the results obtained show that the usual method and the method of the granite melt are of equal accuracy. There are 4 figures, 3 tables, and 11 references, 5 of which are Slavic.

ASSOCIATION: Saratov State University imeni N. G. Chernyshevskiy (Saratovskiy gosudarstvennyy universitet im. N. G. Chernyshevskogo)

AVAILABLE: Library of Congress

1. Rocks-Beryllium-Determination 2. Minerals-Beryllium-Determination 3. Alloys-Beryllium-Determination 4. Dichorsulphodimethyloxy-fuksondicarboxylic 5. Acid-Application

Card 2/2

MUSTAFIN, I.S.; MATVEYEV, L.O.; KASHKOVSKAYA, Y[illegible].A.

Analytical properties of hydroxyquinones. Report No. 1: Derivatives of 2,5-dihydroxy-1,4-benzoquinone. Trudy kaf. anal. khim. 11:87-96 '60. (MIRA 13:10)

1. Kafedra analiticheskoy khimii i Institut geologii Saratovskogo gosudarstvennogo universiteta.
(Benzoquinone)

MATVEYEV, L.O.; MUSTAFIN, I.S.

Photometric determination of beryllium in bronzes. Trudy kom. anal. khim. 11:217-222 '60. (MIRA 13:10)

1. Kafedra analiticheskoy khimii i Institut geologii Saratovskogo gosudarstvennogo universiteta.
(Beryllium--Analysis) (Bronze--Analysis)

MATVEYEV, Capt. L. T.

Cand. Physico Mathematical Sci.
"Review of I. Ya. Tanatar's Aerology," Vest. Vozdush. Flota, No. 1, 1949.
Mbr., Main Geophysics Observatory im Voyeykov, main Admin. Hydrometevrobgical Service, Council Ministers,-1947-.

MATVEYEV, L. T.

Winds

Problem of the dispersion of wind velocity in the boundary layer of the atmosphere and determination of parameters of turbulent exchange. Met.i gidrol. no. 3, 1949.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

MATVEYEV, L.T.

"Problems of the Advective-Dynamic Theory of Cyclo- and Anticyclogenesis," Sb. Tr. Leningr. Gidrometeor. in-ta, No 3, 203-211, 1954

In an advective-dynamic analysis, cyclogenesis is considered as a partial case of the general transformation of the baric field. A deficiency of the conditions obtained by N.E. Taborovskiy (Tr. NII GUGMS, Ser. II, No 26, 1947) for the beginning of cyclo- and anticyclogenesis is that there must be some singularity or other already by the beginning of the process in the baric field. However, from the second approximation formula of I.A. Kibel' (Izv. AN SSSR, Ser. geogr. i geofiz., No 5, 1949), one can obtain the conditions for cyclogenesis in a nondisturbed baric field, if one takes account in this formula the term that is dependent on the variation of the horizontal gradient of temperature in the direction of the general transfer. The beginning of the formation of disturbances can be due only to the nonequilibrial distribution of temperature in the horizontal direction. The isobars here can be rectilinear and equidistant. The pressure falls if the horizontal gradient of temperature in-

continued:

continued:

MATVEYEV, L.T.

"Problem of the Advective-Dynamic Theory of Cyclo- and Anticyclogenesis," Sb.Tr. Leningr. Gidromet. in-ta, No 3, 203-211, 1954

creases in the direction of flow, and grows in the reverse case. This result was empirically observed by N.I. Byzov (Meteorol. i Gidrologiya, inform. sb. [Informational Symposium], No 6, 1946). (RZhGeol, No 1, 1955)

SO: Sum. No. 536, 10 Jun 55

MATVEYEV, L.T.; SMIRNOV, P.I.; ASTAPENKO, P.D.; IGNAT'YEV, N.I., red.; SRIBIS, N.V., tekhn. red.

[Principles of aviation meteorology] Osnovy aviatsionnoi meteorologii; odobreno Glavnym Shtabom Voenno-Vozdushnykh Sil v kachestve uchebnogo posobiia dlia kursantov aviatsionnykh uchilishch i shkol VVS Sovetskoi Armii. Moskva, Voenizdat, 1955. 334 p. (MIRA 16:11)
(Meteorology in aeronautics)

MATVEYEV, LEONID TIKHONOVICH

PHASE I BOOK EXPLOITATION 14

Gandin, Lev Semenovich; Laykhtman, David L'vovich; Matveyev, Leonid Tikhonovich; and Yudin, Mikhail Isaakovich

Osnovy dinamicheskoy meteorologii (Principles of Dynamic Meteorology) Leningrad, Gidrometeoizdat, 1955. 646 p. 4,000 copies printed.

Ed. (title page): Laykhtman, D. L., Professor, and Yudin, M. I., Professor; Responsible Ed.: Pyatygin, K. V.; Ed. (inside book): Vlasova, Yu. V.; Tech. Ed.: Soloveychik, A. A.

PURPOSE: This book, which is a treatise on dynamic meteorology developed by the author in the course of lecturing at various universities, is intended as a textbook for meteorology students of vuzes and as a handbook for specialists in the field of meteorology and climatology.

COVERAGE: The book examines the basic methods of dynamic meteorology, making extensive use of mathematical treatment in analyzing the physical processes taking place in the atmosphere. The latest developments

Card 1/12 2

in this branch of meteorology are presented. Chapters VII and X were written by S. I. Titov and A. S. Dubov, respectively. There are 65 references, 43 Soviet, 13 English and 9 German.

TABLE OF CONTENTS:

FD-2772

USSR/Geophysics - Atmospheric currents

Card 1/2 Pub 45 - 6/13

Author : Matveyev, L. T.

Title : Vertical currents in the boundary layer of the atmosphere

Periodical : Izv. AN SSSR, Ser. geofiz., Sep-Oct 1955, 453-461

Abstract : The author works out a method for calculating the vertical velocity in the boundary layer of the atmosphere, which method takes into consideration the influence of the most important factors: thermal stability, roughness of the earth's surface, velocity of free flow, and latitude of the place. Calculation of the vertical velocity in the limits of the boundary layer of the atmosphere and also calculation of the parameters of turbulent exchange (coefficient of turbulence, turbulent tangential stress, etc.) are carried out by means of data taken only from a synoptic map. The author acknowledges the interest of M. Ye. Shvets in the present work. Twelve references: e.g. M. Ye. Shvets, "determination of the coefficient of turbulent viscosity for atmospheric movements," DAN SSSR, 30, No 8, 1941; L. T. Matveyev, "problem of determining the coefficient of exchange in the boundary layer of the atmosphere, Meteorologiya i gidrologiya, No 4, 1940.

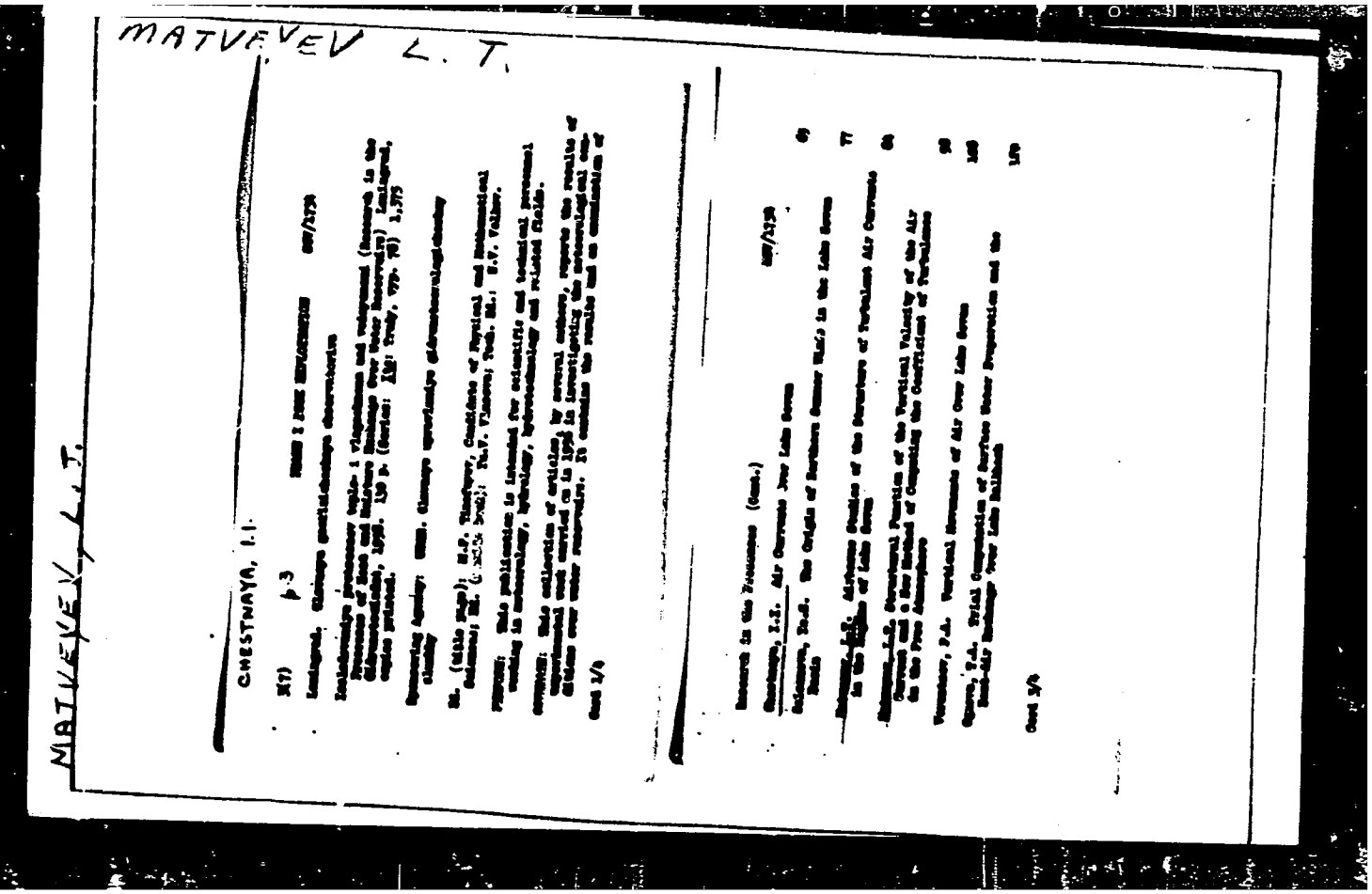
Leningrad Hydrometeorological Inst.

MATVEYEV, L.T.

Principles of the qualitative analysis of conditions of vortex formation in the atmosphere, and some results of verifying them. Meteor.i gidrol. no.4:28-31 Ap '56. (MLRA 9:8)
(Atmosphere)

MATVEYEV, L.T.; KOZHARIN, V.S.

Role of turbulent agitation in forming the structure of stratus clouds. Part 1. Izv. AN SSSR.Ser.geofiz. no.11:1338-1353 N '56.
(Clouds) (Atmospheric turbulence) (MLRA 10:1)



MATVEYEV L. T.

CHESTNAYA, I.I.

MATVEYEV, L.T.

AUTHORS: Matveyev, L. T., Zyabrikov, V. A. SOV/ 50-58-7-11/20

TITLE: On the Qualitative Analysis of the Conditions of the Formation of Vortexes in the Atmosphere (O kachestvennom analize usloviy vikhreobrazovaniya v atmosfere)

PERIODICAL: Meteorologiya i gidrologiya, 1958, Nr 7, pp. 42-47 (USSR)

ABSTRACT: P. I. Brounov (Ref 1) was the first to find the rules governing the conditions of formations of cyclones and anticyclones and their motions. In the last 10 - 15 years new qualitative rules governing the development of synoptic processes have been formulated by N. L. Taborovskiy (Ref 1), V. A. Bugayev (Ref 3) et al. L. T. Matveyev in his articles outlined a somewhat different way of substantiating the qualtitative rules (Refs 7, 8). As in the course of the last years different opinions have been uttered with respect to the role played by the terms of the equation (1)

$$\frac{d\Omega_z}{dt} = \frac{2\omega_z}{T}\left(u_g\frac{\partial T}{\partial x} + v_g\frac{\partial T}{\partial y}\right) - \beta v_N - (2\omega_z + \Omega_z)\left(\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y}\right) \quad (1)$$

Card 1/4 for the processes of cyclogenesis the author tried to determine

On the Qualitative Analysis of the Conditions of the Formation of Vortexes in the Atmosphere

the magnitude of single terms of the equation of the vortex transfer (perenos vikhrya) in a quantitative way. In the papers by Kh. P. Pogosyan and A. I. Burtsev (Ref 11) convincing experimental evidence is given which explains the role played by the temperature advection during the individual stages of the formation of cyclones. S. S. Klyucharev lately furnished interesting experimental data. Ye. P. Borisenkov calculated the divergence of the wind velocity in cases where the coordinate axes take various directions and the space interval of the differentiation has different lengths. In the last 20-25 years there have been existing completely opposite opinions with respect to the role played by the divergence (B. M. Mikhel', R. Sherkhag, B. D. Usprenskiy et al.). The horizontal baroclinal (geostrophic temperature advection) was taken into account for the first time by Ye. N. Blinova (Ref 2). Later on this theory was further developed by Ye. N. Blinova, I. A. Kibel', C. A. Mashkovich, A. M. Obuchov et al. The investigation results obtained by Mashkovich as well as the experience collected in the compilation of weather forecasts by means of electronic computers proved that the least

On the Qualitative Analysis of the Conditions of the Formation of Vortexes in the Atmosphere

accurate forecasts made according to scheme without taking into account the horizontal baroclinal were those where cases of a strong change (re-formation) of the pressure field had taken place. In the estimation of the horizontal baroclinal also the possibility of the formation of resonances between the waves in the temperature and pressure field must not be neglected. In the case of a strong increase of the pressure wave amplitude the wave looses its stability. This phenomenon was for the first time discovered by K. Rossbi and Ye. N. Blinova (Ref 6). The authors of the present paper also point to the critical remarks made by L.S. Gnedin and A. S. Dubov (Ref 5) as well as the charts elaborated by Kh. P. Pogosyan. The authors regard the scheme proposed by N. I. Buleyev and G. I. Marchuk (Ref 4) as the most perfect modern scheme for making forecasts. The aim of the present paper was to point out certain facts which could be useful in the explanation of the physical processes in the re-formation of the thermobaric atmospheric field as well as in the formation of the theory of cyclogenesis. The discussions of the role

On the Qualitative Analysis of the Conditions of the Formation of Vortexes in the Atmosphere

played by the individual factors in the formation of vortexes proves the importance of a theory of the atmospheric processes which takes into account the synoptical experience and the experimental data collected. There are 1 figure, 1 table, and 14 references, 13 of which are Soviet.

1. Meteorology--USSR 2. Cyclones--Analysis 3. Anticyclones--Analysis 4. Mathematics

AUTHOR: Matveyev, L.T. SOV/49-58-7-13/16

TITLE: Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere (Kolichestvennyye kharakteristiki turbulentnogo obmena v verkhney troposfere i nizhney stratosfere)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 7, pp 927 - 931 (USSR)

ABSTRACT: Calculations of turbulent exchange parameters in the surface layers of the atmosphere have already been worked out - in Russia by Laykhtman (Ref 1), Budyko (Ref 2), Obukhov (Ref 3), Monin (Ref 4), Timofeyev (Ref 5) and abroad by authors mentioned in Sutton (Ref 6). Much less work has been done on the parameters at 1-1.5 km height - Yudin and Shvets (Refs 7 and 8), Berlyand (Ref 9), the author (Refs 10 and 11) and Laykhtman (Ref 12) are mentioned. Quantitative data for the parameters (and, particularly, the turbulence coefficient) at heights greater than 1-2 km are almost completely absent. Khrgian (Ref 13) has made an order of magnitude estimate of the turbulence coefficient in the lower atmosphere from the change in oxygen concentration with height. Much work has indicated also that turtule[illegible]

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Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

exchange plays an important part in many processes, e.g. in cloud formation (Ref 14). Dubov and Yudin (Refs 16 and 15) have considered the effect of turbulence on aeroplane motion.

The coefficient of vertical, turbulent exchange k can be obtained from an equation due to Lyapin (Ref 17):

$$k = \frac{u\tau\overline{w^2}}{2\overline{u'}} \qquad (1)$$

where u is the average horizontal wind velocity, u', w are the absolute horizontal and vertical magnitudes of the pulsations in wind velocity, τ is the average lifetime of a pulsation and the bar indicates averaging.

Hyperbolic-type equations were obtained for the surface layers by Lyapin (Refs 17 and 18) and Monin (Refs 19 and 20) - the latter considered turbulent exchange as a random process. Eq.(1) holds for a stationary apparatus measuring the pulsations with an air stream round it of velocity u .

Dubov (Ref 21) showed that, with a moving apparatus (e.g. an aeroplane), the relationship becomes:

$$k = \frac{v\overline{w}^2}{2u'} \qquad (2)$$

where v is the relative velocity of the apparatus.
In a free atmosphere, the turbulent pulsations are locally isotropic so that:

$$\frac{w}{u'} \approx 1 \qquad (3) .$$

The vertical pulsation velocity is connected to the displacement of the aeroplane by (Ref 22):

$$w = b\Delta n \qquad (4)$$

where $\Delta n = n - 1$ is the displacement, n is the acceleration of the aeroplane and b is a coefficient depending

on the type of aeroplane. b is calculated from :

$$b = \frac{2\frac{G}{S}}{\rho v c_y^{\alpha}} \qquad (5)$$

where G/S is the specific loading, c_y^{α} is the lift coefficient at a given angle of attack, v is the air speed of the aeroplane, ρ is the air density. From Eqs.(3),(4) and (5), (2) becomes

$$k = \frac{\frac{G}{S}\tau}{\rho c_y^{\alpha}} \overline{\Delta}_n \qquad (6)$$

where $\overline{\Delta}_n$ is the absolute magnitude of vertical displacement of the aeroplane.

Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

The turbulence coefficient can be obtained from Eq.(6) and accelerograph measurements in an aeroplane. The method of Vorontsov and Dubov was used by the author (Ref 21). $\overline{\Delta n}$ in Eq.(6) was averaged over 180 - 960 instantaneous values. The magnitude of the turbulence coefficient obtained from Eq.(6) was generally several tens in m^2/sec.

The basic aim of the article is to establish the connection between the coefficient of turbulent exchange and the basic physical parameters on which the thermodynamic stability and turbulent mixing depend. The following calculations were therefore made: a) vertical temperature gradient:

$$\left(\gamma = - \frac{\partial T}{\partial z} \right)$$

and wind velocity:

Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

$$\beta = \sqrt{\left(\frac{\partial u_x}{\partial z}\right)^2 + \left(\frac{\partial u_y}{\partial z}\right)^2}$$

where u_x, u_y are the projections of u on the horizontal axes, z-vertical;

b) dimensionless parameter Ri (Richardson number):

$$Ri = \frac{g}{T} \frac{\gamma_a - \gamma}{\beta^2}$$

where g is the acceleration due to gravity, T is absolute temperature, γ_a is the dry adiabatic gradient;

c) wind velocity u at height of flight. γ and β were calculated for a layer 1 km thick. k is determined in terms of γ, β and Ri and u - it enters into the equation for turbulent friction as:

$$\tau^* = -\overline{\rho u'w} = k\rho\beta \qquad (7).$$

As the dimensions of $[\tau/\rho]$ are m^2/sec^2, we can write:

$$\frac{\tau}{\rho} = u^2\varphi(Ri) \qquad (8).$$

Hence, from Eqs.(7) and (8),

$$k\beta = u^2\varphi(Ri) \qquad (9)$$

or

$$B = \varphi(Ri) \qquad (10).$$

The author divided his results into four groups and values of B and Ri found for each - Tables 1 and 2 and Figure 1. Comparison of the tables shows that there is an almost linear relation between B and log Ri . Hence, we can write:

Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

$$B = a - m \lg Ri \qquad (11) .$$

a and m are determined by a least-squares method which gave:

$$\frac{k\beta}{u^2} = 10^{-4}(17.92 - 11.57 \lg Ri) \qquad (12) .$$

Since Ri depends only slightly on temperature, taking an average value (e.g. $\bar{T} = 240\ ^{\circ}K$ for the upper troposphere), a relationship can be established between k and β, γ and u. Thus:

$$k = \frac{u^2}{\beta}\left[2\ 314 \lg \beta - 1\ 157 \lg(\gamma_a - \gamma) - 0.072\right] \qquad (13)$$

where β is the vertical gradient of the wind velocity in m/sec km , γ is in degrees/km. Table 3 gives the results of calculations using Eq.(13).

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Quantitiative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

The turbulence coefficient for fixed values of u and β increases with the vertical temperature gradient. In comparison, the dependence of k on β is relatively small and increases, generally, with β . Eq.(12) shows that the turbulence coefficient varies as the square of the wind velocity u . Hence, in the jet-stream region where the wind velocity reaches tens or even hundreds of m/sec, the turbulence coefficient increases rapidly. From Eqs.(6) and (12), a connection can be found between the displacement of an aeroplane and the basic atmospheric parameters. Introducing the turbulent scale length, l ,

$$u' \sim w \sim l\beta \qquad (14)$$

and, from Eq.(7):

$$k = l^2\beta \qquad (15) .$$

Also:

$$l = 2\tau v \qquad (16)$$

Quantitative Characteristics of Turbulent Exchange in the Upper Troposphere and Lower Stratosphere

so:

$$\tau = \frac{1}{2v}\sqrt{\frac{\overline{k}}{\beta}} \qquad (17) .$$

Substituting for τ in Eq.(6) and for k from (12) gives finally:

$$\overline{\Delta n} = 4.10^{-2} \frac{u}{b} \sqrt{17.92 - 11.57 \log Ri} \qquad (18).$$

There are 1 figure and 3 tables and 22 references, 21 of which are Soviet and 1 English.

SUBMITTED: May 31, 1957

Card 10/10 1. Atmosphere--Turbulence 2. Turbulence--Mathematical analysis

MATVEYEV, Leonid Tikhonovich for Doc Phys Math Sci on the basis of dissertation defended 17 Nov 59 in Council of Central Inst of Forecasts, entitled "Experience in constructing a theory of the formation and evolution of stratoform clouds." (BMViSSO USSR, 1-61, 25)

3 (7)

AUTHOR: Matveyev, L. T. SOV/5C-[illegible]/21

TITLE: On the Theory of Cloud Formation and Condensation Trails Under the Influence of Mixing (K teorii obrazovaniya oblakov i samoletnykh oblachnykh sledov pod vliyaniyem peremeshivaniya)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 3, pp 3 - 9 (USSR)

ABSTRACT: In this paper a method is given of computing the water content of the clouds forming under the influence of mixing (among them also that of the condensation trails of airplanes) as well as the conditions of their formation. Formula (1) for the temperature T of the mixture and formula (2) for the specific humidity of the mixture are written down. The parameter n contained in both formulas denotes the ratio of the masses of the mixing air volumes. It is assumed that the specific heat of the air volumes is equal. Strictly speaking, formula (1) holds for the horizontal mixing. In a vertical mixing all temperatures must be replaced by the potential temperatures. Since under real conditions in the atmosphere steam condensation begins only after saturation, formula (3): $\delta = s - s_m$ is

Card 1/4 written down for the specific water content δ of the cloud

(mass of the water drops and of the ice crystals in 1 g air). s_m denotes the maximum specific humidity at a temperature T and a pressure p. The parameter n assumes different values in different parts of the cloud. In this paper the value n is found corresponding to the part of the cloud with a maximum water content; formula (9). In this connection the parameter $B = p\frac{s_2 - s_1}{T_2 - T_1}$ is introduced. s_1 and s_2 denote the specific humidities and T_1 and T_2 the temperatures of the mixing air volumes. The dependence of the temperature on B is given in a diagram, figure 1. This temperature T of the air formed in the mixing may be determined from a known B from the diagram. This temperature only depends on B. If T is known the parameter n corresponding to the maximum water content of the cloud can be found from formula (1): formula (9). By inserting s and n from (2) and (9) into (3) formula (10) which is then transformed into (11) is obtained for δ. (11) may be represented in two forms (12) and (13). They make it possible to solve generally the problem of the possibility of cloud formation by mixing.

Formulas (16) and (17) are obtained. They establish the connection between T_1^*, R_1 and B or T_1^*, τ_1 and B. T_1^*- denotes the temperature at which the water content of the cloud is equal to zero. τ_1- denotes the dew point in the colder air mass. R_1- the relative humidity. The relation between these quantities is shown in the diagram, figure 2. The problem of the possibility of cloud formation under the influence of mixing may be solved on the basis of this figure. The formula for the parameter B is transformed into equation (19) by introducing the difference between the dew point values and by using the Magnus formula. Finally, the author proceeds from the specific water content δ of the cloud to the absolute water content, δ^* of the cloud and derives formula (21) for the latter. This shows that the water content of the cloud depends on three parameters: B, T_1 and τ_1. δ^* is then represented in the form of a difference $\delta^* = \delta_T - \delta_\tau$ (formula 22) where δ_T and δ_τ are quantities depending on B and T_1 and B and τ_1 respectively, δ_T and δ_τ are determined

from the known B, T_1 and τ_1 and the water content of the cloud formed by the mixing (or the condensation trail of the airplane) is found from (22). The absolute water content of the cloud is the mass of the water drops in 1 cm^3 air. There are 4 figures and 2 references, 1 of which is Soviet.

MATVEYEV, L.T.

Some problems in the theory of the formation and evolution of stratiform clouds. Trudy AANII 228:14-37 '59.
(MIRA 13:2)

(Arctic regions--Cloud physics)

VOROB'YEV, Valeriy Igorevich; MATVEYEV, L.T., dotsent, otv.red.; USHAKOVA, T.V., red.; BRAYNINA, M.I., tekhn.red.

[Jet streams in high and temperate latitudes] Struinye techeniia v vysokikh i umerennykh shirotakh. Leningrad, Gidrometeor.izd-vo, 1960. 233 p. (MIRA 13:7)
(Jet stream)

3.5000

S/049/60/000/01/009/027
E201/E191

AUTHOR: Matveyev, L.T. 82245

TITLE: Derivation of the Dependence of the Turbulence Coefficient on the Height in the Lowest Layer of the Atmosphere 12

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1960, No 1, pp 83-88

TEXT: About 30 years ago B.I. Izvekov suggested the following exponential formula for the turbulence (mixing) coefficient:

$$k = k_{\infty}(1 + \varepsilon - e^{-mz/z_1}), \qquad (1)$$

where $k_{\infty}(1 + \varepsilon) \approx k_{\infty}$ is the turbulence coefficient at a sufficient height; m is a nondimensional parameter which depends on thermal stability of the layer considered; $\varepsilon = k_0/k_{\infty}$ is a small nondimensional quantity equal to the ratio of the turbulence coefficients at the ground surface (k_0) and well above the layer considered (k_{∞}); z_1 is a certain fixed height. Analysis of the available experimental material (Figs 1-5) showed that Eq (1) describes the variation of k with height under the conditions of stable stratification of the lowest layer of the atmosphere

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(Ri > 0). When this stratification is unstable (Ri < 0) the dependence of k on height is given by the author's formula (Refs 4, 5):

$$k = k^{*} (e^{pz/z_1} + \varepsilon - 1), \qquad (2)$$

The present paper gives a theoretical derivation of the power law which gives the dependence of the turbulence coefficient on height using the ideas of similarity and dimensions. The result is the following expression:

$$k = \frac{v_{*}}{a} [(1 + a\ell_0)e^{\varkappa az} - 1]. \qquad (26)$$

where $v_{*} = \sqrt{\tau/\rho}$ is the "friction" velocity, τ is the turbulent friction force, ρ is the density of air, $\varkappa$ is Kármán's constant, ℓ_0 is the mixing path length at the ground level ($z = 0$), and a is a certain constant defined by Eq (21) (both a and ℓ_0 are found experimentally). Eq (26) has the same exponential nature as Eqs (1) and (2).

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TITLE: Application of the Empirical Influence Functions for Forecasting the Boundaries of Cloudiness

PERIODICAL: Meteorologiya i gidrologiya, 1960, No. 9, pp. 11 - 15

TEXT: The author worked out a method of forecasting cloud boundaries by making use of so-called empirical influence functions. These functions had already been used by other authors (Refs. 3,6,7) to forecast the pressure field. Empirical influence functions for forecasting cloud boundaries can be established on the basis of equations describing the humidity and heat transport in the atmosphere: formulas (1) and (2). If there is cloudiness, formula (3) constitutes the third equation of this system. It denotes the relationship between the maximum specific humidity s_m, on the one hand, and temperature and pressure, on the other. It may be seen from the system (1) - (3) that the three unknown quantities: rate of variation of the local temperature; specific humidity of

water vapor; and condensation rate of the latter, are determined by the following factors: 1) thermal advection δT_a and specific humidity δs_a; 2) convective heat and humidity transfer along the vertical lines; and 3) turbulent heat and humidity inflow. M. Ye. Shvets (Ref. 5) showed that the differential equation obtained from (1) - (3) for the condensation rate m is nonlinear. Since this differential equation is very difficult to solve, great interest is attached to the determination of formulas for the calculation of cloud height variations in an empirical way. The author proceeds from the following assumptions: The variation of the cloud boundary height with time is directly related to m; at a certain level there is practically a linear relationship between the variations of δs_a and the thawing point (τ); the vertical speed component w in the lower strata of the atmosphere is approximately proportional to Laplace's equation of pressure at sea level. Thus, the influence functions have the form of equation (4):

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$$\delta h = l_o + \sum_{i=0}^{i=8} a_i \delta T_{ai} + \sum_{i=0}^{i=8} b_i \delta \tau_{ai} + \sum_{i=0}^{i=8} c_i \Delta p_i (\theta_{1i} - \theta_{oi}) + \sum_{i=0}^{i=8} d_i \Delta p_i (\tau_{1i} - \tau_{oi}).$$

δh is the forecast variation in the height of the lower boundary of a nonconvective cloudiness for 6, 12, or 24 hours at the point i=0; δT_{ai} and $\delta \tau_{ai}$ are the advective temperature and thawing-point variations at the point i in the same time intervals; Δp_i is Laplace's equation of pressure at sea level; $\theta_{1i} - \theta_{oi}$ is the difference of the potential temperatures at the 850-mb isobar level and at the earth's surface at the point i; $\tau_{1i} - \tau_{oi}$ is the difference of the thawing-point values at the same levels; a_o [Abstracter's note: seemingly a printing error standing for l_o], a_i, b_i, c_i, d_i are the empirical coefficients (influence coefficients) determined by the method of least

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squares (Ref. 4). Fig. 1 shows the position of the points for which the empirical quantities indicated were calculated. Next, the author gives the results obtained from a calculation of the empirical influence functions for Moscow when forecasting the variation in height at the lower boundary of a nonconvective cloudiness over 12 hours. The calculations were first made by hand, and certain mean influence coefficients were substituted into formula (4). Thus, the latter adopted the form of equation (5): $\delta h = a_0 + a\delta T_a + b\delta\tau_a + c\ p(\theta_1 - \theta_0) + d\ p(\tau_1 - \tau_0)$. δT_a, $\delta\tau_a$, $p(\theta_1 - \theta_0)$, $p(\tau_1 - \tau_0)$ are the mean arithmetical values of the respective quantities. The mean influence coefficients obtained for Moscow from calculations of 100 cases in the fall-winter time are given under (6). Calculations were later made on an electronic computer. Results are given in Table 1. Formulas (4) and (5) were verified by an independent series of observations (80 cases). The mean absolute value of the relative error was 1) 34% when making use of formula (4) and the coefficients given in Table 1, and 2) 47% when using formula (5) and

the coefficients (6). It is pointed out that considerably larger errors than those mentioned may be sometimes found. This is less imputable to the shortcomings of this method than to insufficient accuracy of the calculation of the quantities contained in formulas (4) and (5). These formulas show that thawing-point data accurate up to tenths of degrees are absolutely necessary. There are 1 figure, 1 table, and 7 references: 5 Soviet and 2 US.

Formula 4:

$$\delta h = l_0 + \sum_{i=0}^{i=8} a_i \delta T_{ai} + \sum_{i=0}^{i=8} b_i \delta \tau_{ai} +$$
$$+ \sum_{i=0}^{i=8} c_i \Delta p_i (b_{1i} - b_{0i}) + \sum_{i=0}^{i=8} d_i \Delta p_i (\tau_{1i} - \tau_{0i}).$$